FARMING IN THE DESERT

Today, irrigation and cultivation make rich farm lands out of some of this country's most arid areas. Here are now being harvested some of our most useful and profitable crops—thanks to the man-made provision of sufficient water, and to the wise use of fertilizer. Many of these fertilizers are compounded with potash—often with Sunshine State Potash, a product of New Mexico. This outstanding soil nutrient increases soil fertility, and insures greater resistance to plant diseases and drought.

SUNSHINE STATE POTASH
PRODUCT OF NEW MEXICO U.S.A.

Reg. U. S. Pat. Off.

HIGRADE MURIATE OF POTASH 62/63% K_2O
GRANULAR MURIATE OF POTASH 48/52% K_2O
MANURE SALTS 22% MIN. K_2O

UNITED STATES POTASH COMPANY, *Incorporated*, 30 Rockefeller Plaza, New York 20, N. Y.

The American FERTILIZER

Vol. 109 SEPTEMBER 18, 1948 No. 6

Your Trees Will Tell You about Their Nitrogen Needs*

By DAMON BOYNTON
Cornell University Ithaca, N. Y.

MOST fruit growers would agree that nitrogen fertilization pays them high dividends; but there is a difference of opinion on the amount to apply, and there is marked interest in the effects of different times and methods of application. This is not surprising since many factors are involved in determining the response of fruit trees to nitrogen. The kind and variety of fruit, the climatic conditions of the region, and the soil management system all must be taken into account in setting up a nitrogen fertilizer program for a particular block of trees.

The first consideration is the kind of fruit. Nitrogen must be furnished to all fruit trees in one form or another, and for maximum yields peach and sour cherry have to be kept in a more vegetative condition than does the apple. This is why peach and sour cherry orchards are almost always cultivated during the first part of the growing season, while apple orchards are more commonly kept in sod.

There are also considerable differences in the nitrogen requirements of different apple varieties under sod culture. In New York, the color and quality of McIntosh and Northern Spy fruits are more likely to be seriously decreased by heavy nitrogen fertilization than are color and quality of Cortland. Because Twenty Ounce Pippin goes largely to the cannery, fruit color of that variety is of little commercial importance; but Twenty Ounce is very susceptible to fire blight, and several of our growers have found that high-nitrogen fertilization may increase their susceptibility seriously in blight years.

The second consideration is the climate of the region. The peach attains its best market quality when it ripens in relatively warm weather. High-nitrogen peach trees mature their fruits more slowly than low-nitrogen peach trees. In the southern Hudson Valley, Elberta ripens in late August when the weather is warm; under such conditions fruit from trees rather high in nitrogen usually develops good quality. However, close to Lake Ontario in Western New York, Elberta ripens in late September when the weather is likely to be cool, and under those conditions fruit from high-nitrogen trees may never attain good market quality. On the other hand, with the McIntosh apple, the detrimental effects of high-nitrogen fertilizer on fruit color are likely to be more serious in the southern Hudson Valley than in the Champlain Valley of New York.

The third consideration is the soil management system. Cultivation, of course, makes soil nitrogen available and eliminates grasses that would compete with the trees for applied nitrogen. The more fertile the soil, the longer the period of cultivation, and the less cover growth following cessation of cultivation, the

*Reprinted from "American Fruit Grower," September, 1948.

greater will be the contribution of nitrogen to the tree. In sod orchards, the vigor and completeness of the sod cover determines how much it competes with the trees for nitrogen. Where supplementary mulch is used over a period of years, it may contribute more than enough nitrogen for the use of the trees, although initially it will cause a reduction in available nitrogen supply.

When all the factors which influence the nitrogen needs of fruit trees are considered, it is clear that general recommendations have a limited value in determining amounts of nitrogen to apply and the times and methods of application. One must ask the trees, themthelves, many questions and watch for their replies in terms of growth, leaf color, bloom, set, fruit color, time of harvest, and fruit quality. The grower who has some well-chosen trees on which he observes the effects of several levels of supplementary nitrogen fertilization will come closest to the right answer for his particular situation over a period of years. Under northeastern conditions the actual nitrogen applied under mature test trees might be at acre rates of zero, 25 and 50 pounds, with possibly one additional higher application rate.

Time of Application

While fall application has been fairly common in New York during the last years of nitrogen shortage, our growers feel safer to wait until early spring when they can. This is because serious low temperature injuries to trunks occasionally occur which may be associated with high levels of nitrogen in the tree during the late fall. The book is still open on this problem, and if it can be definitely established that these trunk injuries are not brought about by fall fertilization, more northeastern growers will be interested in the practice.

The shortage of granular "straight nitrogen" fertilizers has also caused interest in the possibilities of anhydrous ammonia, and liquid ammonium nitrate solution for use as nitrogen supplements in northeastern orchards. Ammonia gas probably has no place in our orchards because of the difficulties of making an effective application. We do not irrigate, so it cannot be distributed in irrigation water, and our orchard floors are not cultivated clean enough to permit subsoil application behind cultivator chisels. Liquid ammonium nitrate solutions have been successfully applied in orchards by one commercial dealer in New York State. There are several distribution problems because of its caustic nature and because the solution in the tank car is highly concentrated; however, if the cost of nitrogen applied to the trees in this farm is low enough, it may have a future place in the fertilizer programs of some northeastern orchards.

Fertilization by Sprays

There is also considerable interest in the usefulness of sprays of urea for nitrogen fertilization of fruit trees. Urea solutions are absorbed by leaves, and at five pounds to 100 gallons have appeared to cause no direct injury to them. They seem to be compatible with fungicides and insecticides. Urea is a high-nitrogen compound readily soluble in water and manufactured in large quantity at a reasonable cost per nitrogen unit. Three sprays at five pounds per 100 gallons are equivalent to a moderate soil application of fertilizer nitrogen. If there is reason to use them, they might have some place in a commercial program. The most likely reason for fertilizing fruit trees in this way would be to improve the timing of nitrogen effect. If, for instance, it were desirable to insure maximum set of fruit on a low-nitrogen apple tree with moderate bloom, the use of urea in pre-pink and pink sprays might be helpful. On the other hand, if a grower wanted to discourage a high-nitrogen apple tree with heavy bloom from setting a heavy crop, he might omit ground fertilization with nitrogen and add urea to the calyx and early cover sprays. These and other possible special uses for urea sprays are under investigation and we will know more about their possibilities and limitations in a few years. At the present time moderate annual spring ground applications of nitrogenous fertilizers are the rule in most New York orchards, and the amount is determined by the response of the trees under their particular climatic and soil conditions.

Radioactive Isotopes Used in Foreign Experiments

The U. S. Atomic Energy Commission has reported the shipments of 216 lots of radioactive isotopes, covering eleven of the chemical elements, to experimental laboratories in 21 foreign countries. Almost half of these shipments consisted of phosphorus 32, the isotope which is being used extensively in the investigation of fertilizer efficiency and distribution in the growing plant. It is also used in the studies of certain forms of disease, notably leukemia. The results of the experimental work will be reported to the Atomic Energy Commission.

Soil Conservation Raises Midwest Crop Potentials*

By L. R. COMBS
Soil Conservation Service, Milwaukee, Wisc.

WHAT will happen to total farm output in the Corn Belt and Lake States when a complete soil and water conservation plan is applied to all the agricultural land?

Some of the more important changes that may occur are:

A 2-billion-bushel average farm crop per year, or about 30 per cent above the average for the four pre-war years, although corn acreage would decrease from 38.4 million to 35 million acres.

A 10 per cent increase in total small grain production from a smaller acreage.

More than twice as much feed from hay and rotation pastures as before the war.

About double the feeding value from permanent pastures.

A 20 to 25 per cent increase in dairy production; more than a doubling of beef production; and pork production at about 1937–1941 levels.

In spite of these increases in livestock numbers, farmers would still raise and ship out considerably more feed grains, especially corn, than would be required in the North Central States.

These facts are revealed by a study recently completed by George H. Walter, Agricultural Economist, Bureau of Agricultural Economics, Milwaukee, Wisconsin. Using figures on present land use, the capabilities of land, and conservation needs already developed by the U. S. Soil Conservation Service, Mr. Walter determined the possible effects on production if a soil conservation program were applied to all the agricultural lands of the eight-state Upper Mississippi Region. This region includes Minnesota, Missouri, Michigan, Iowa, Illinois, Indiana, Ohio, and Wisconsin. Entitled "Possible Effects of Conservational Land Use on Production in the Corn Belt and Lake States," the report of his study is the first of its kind.

A complete program of soil and water conservation, developed and applied farm by farm and acre by acre, would involve shifting land to its best and most profitable use, the necessary soil treatment and adapted rotations, and the use of contouring, terracing, strip-cropping, grassed waterways, and other practices as needed.

If land in the Upper Mississippi Region were put to its best and most profitable use, farmers would shift 24.6 million acres of permanent pasture and idle land into crops. At the same time they would change 24.5 million acres of cropland to other purposes for which it is better adapted.

The net increase in land for crop production (compared to the year 1939) would be only 100,000 acres. But the land shifted to cultivated crops ordinarily would produce more grain than that taken out of cropland. This new cropland would be more level, less erodible, and would have a higher fertility level capable of producing larger yields per acre. At the same time, land not so suitable for rotation crops and shifted to permanent hay or pasture would produce about as much forage as the land taken out of meadow. Thus, the situation is almost one of "have your cake and eat it too."

The use of better rotations and shifts in the use of the open land would result in a 28 per cent increase in the acreage of hay and rotation pastures. At the same time row-crop acreage would decrease 6 per cent and small grain acreage 16 per cent. Farmers would concentrate grain production on the highly productive and less rolling land.

On some of the nearly level and gently rolling land, rotations including enough legumes and grasses would control erosion. But to follow such rotations would necessitate considerable reorganization on many farms. The amount of roughage produced on a farm or in an area might easily exceed the amount which the possible livestock numbers could consume.

If rotations alone were relied upon to control erosion on more level land, only 38.8 million acres in these eight states could safely be planted to row crops in any average year. The average acreage of row crops during the

*Reprinted from "Better Crops with Plant Food," August, 1948.

four pre-war years was 46.9 million. In addition, use of rotations alone to control erosion would decrease small grain acreage from the 38.9 million acres grown before the war to 32 million acres. At the same time such a system would increase the acreage of rotation pasture and hay from a pre-war average of about 42 million to about 60 million acres.

When erosion control practices are used in connection with the rotations, farmers find it possible to have a much larger proportion of small grain and row crops in rotation without danger of erosion. A soil requiring a 6-year rotation, including four years of meadow, where rotations alone are used to prevent erosion, could be farmed with a 3-year rotation including only one year of meadow if a properly constructed terracing system was used. On the same soil, a 4-year rotation including two years of meadow probably would control erosion if used with strip cropping.

The Soil Conservation Service recommends such practices as terracing, strip cropping, or contour farming on about 54.8 million acres of cropland in the Upper Mississippi Region. Use of these three practices where needed will enable farmers in the eight states to grow 5.6 million more acres of row crops without danger of erosion than if rotations are relied on to control erosion. Small grain acreage could be increased by 0.6 million acres over what it would be if rotations alone were depended upon to control erosion. At the same time meadow could be decreased by 6.2 million acres.

The Use of Fertilizer and Lime

Increasing soil productivity by applications of limestone, fertilizer, and manures and plowing under green manure or cover crops is an important conservation practice. The degree of soil fertility that can be maintained greatly influences the type of rotation and also the supporting erosion control practices that are needed.

In many localities the application of lime and fertilizer is necessary before profitable legume and grass crops can be grown in the rotation. The farmer who increases production per acre on the more nearly level land can use the more sloping land, where erosion is most dangerous, for permanent pasture or other erosion-resisting crops.

Nearly 119 million acres now in farms in the Upper Mississippi Region must be limed if they are to grow legumes. About one-fourth of the land that is suitable for crops already has been limed once. With an average requirement of from 2½ to 3 tons of limestone per acre, about 250 million tons of limestone or its equivalent are needed to correct soil acidity on the remaining cropland.

Walter's report indicates that at least an additional 16 million tons of limestone are needed each year to replace losses now taking place because of erosion, leaching, or removal by plants. In five of the eight states, the annual loss of calcium from the farm soils during the war was greater than the rate of application.

Prior to the war, farmers in the eight Upper Mississippi Valley states were applying fertilizer containing 189,000 tons of plant nutrients. During the war this increased to the equivalent of 401,000 tons of plant nutrients. To restore and maintain fertility through the post war years the study indicates that farmers need to apply at least 1,711,000 tons of plant nutrients in fertilizers—an increase of nine times over pre-war application. Accompanying this fertilizer would be the application of 4,770,000 tons of plant nutrients in manure.

Corn Belt state production adjustment committees (PMA) suggest the use of fertilizer on about 50 per cent of the cropland compared with 19 per cent so treated in 1943. These committees also estimated that about 41 per cent of the pastures in the Corn Belt need fertilizer; an estimated 1.7 per cent were so treated in 1943.

Cultivated crops remove an average of about eight pounds of phosphate per acre each year and pasture crops remove about two pounds. Almost equal quantities are lost annually as a result of erosion and leaching. Crops take about 21 pounds of potash per acre each year and pastures use nine pounds. Erosion and leaching cause losses estimated at about three times this figure. Many soils have reached the point where fertilizer is now necessary if any crops are to be raised profitably.

Although it is difficult to determine how much of the increased production claimed by farmers following a good conservation program is a result of the individual practices, it is known that they all play their part. Some of the increased production comes from keeping the fertile topsoil in place and preventing seeds and fertilizers from being washed away or crops washed out.

Increased yields as a result of using commercial fertilizers on corn and other crops have been demonstrated for many years by farmers and State Experiment Stations in all

(Continued on page 24)

Dr. Russell Coleman Chosen Head of National Fertilizer Association

Dr. Russell Coleman, director of the Mississippi Agricultural Experiment Station, has been named president of The National Fertilizer Association, an organization of more than 400 members from all sections of the country. He will succeed Maurice H. Lockwood, who recently resigned to become vice-president of the International Minerals & Chemical Corporation.

Dr. Coleman, presently the youngest director of a State agricultural experiment station, will assume his new duties on November 1st at the Association's offices at Washington, D. C.

Dr. Russell Coleman

A native of Mississippi, the Association's president-elect was born at Montpelier and took his B.S. and M.S. degrees at Mississippi State College, later being awarded his doctorate at the University of Wisconsin. He served as professor of soils at Mississippi State College and associate director of the station. Under his management the station has taken tremendous strides, both through enlargement of its facilities and correlation of its activities.

Dr. Coleman has been intensely interested in research work concerned with the fertilization of commonly grown crops and in scientific studies seeking to unlock the secrets of soil reaction. He has made special investigations of phosphorus as a primary plant food.

He is a member of the American Society of Agronomy, the Soil Science Society of America, the American Association for the Advancement of Science, and numerous honorary societies in scientific and professional fields.

Potash Production for 1947-48 at All-Time High

Potash deliveries in North America reached a total of 1,104,523 tons K_2O during the fiscal year of June 1947 through May 1948, according to the American Potash Institute. This record figure represents an increase of 128,575 tons or 13 per cent more than the corresponding figure in 1946–47. These deliveries were made in 45 states, the District of Columbia, Puerto Rico, Hawaii, Canada, Cuba, and a few other countries, by the five leading American potash producers and include also importations of European potash into the United States. They do not include imports of European potash into Canada.

Deliveries for agricultural purposes in the Continental United States amounted to 929,892 tons K_2O, a 15 per cent increase over last year. Canada received 39,554 tons K_2O, a decrease of 5 per cent; Cuba, 3,488 tons, a decrease of 4 per cent; Puerto Rico, 19,695 tons, the same as last year; Hawaii, 12,140 tons, an increase of 15 per cent; and other countries, 11,514, a decrease of 1 per cent compared to last year.

Georgia again was the leading state for deliveries, with 87,429 tons K_2O, followed in order by Ohio, Illinois, Virginia, North Carolina, and Florida, each taking more than 60,000 tons K_2O. Deliveries, however, do not necessarily correspond to consumption in a given state.

The 60 per cent muriate of potash continued to be the principal grade, comprising 80 per cent of the total agricultural potash delivered. Sulphate of potash and sulphate of potash-magnesia together made up 8 per cent of deliveries; 50 per cent muriate of potash, 6 per cent; and manure salts, 6 per cent, about the same as last year.

Deliveries of potash for chemical uses amounted to 88,240 tons K_2O, an increase of 10 per cent over 1946–47. The 60 per cent muriate grade made up 96 per cent of chemical deliveries, and sulphate of potash, 4 per cent.

THE AMERICAN FERTILIZER

ESTABLISHED 1894

PUBLISHED EVERY OTHER SATURDAY BY
WARE BROS. COMPANY
1900 CHESTNUT ST., PHILADELPHIA 3, PA.

A Magazine international in scope and circulation devoted exclusively to the Commercial Fertilizer Industry and its Allied Industries

PIONEER JOURNAL OF THE FERTILIZER INDUSTRY

A. A. WARE, Editor
K. F. WARE, Advertising Manager

ANNUAL SUBSCRIPTION RATES

U. S. and its possessions, also Cuba and Panama	$3.00
Canada and Mexico	4.00
Other Foreign Countries	5.00
Single Copy	.25
Back Numbers	.50

Vol. 109 SEPTEMBER 18, 1948 No. 6

Principal Articles in This Issue

World Has Enough Soils to Feed Increased Population

The world problem of feeiding an increasing population is not so much a matter of productive soils as it is of developing social institutions to put the soils into production, according to Dr. Charles E. Kellogg, soil scientist of the U. S. Department of Agriculture.

Speaking before the American Farm Economic Association at Green Lake, Wis., Dr. Kellogg said potential new land and increased production possible on land now farmed can give us food significantly beyond that needed for the estimated world population of 1960.

Dr. Kellogg estimates 1,300,000,000 acres of unused land can be developed for crop production. A billion of these acres are in the tropics, in Africa, South America, and on the large tropical islands. The remainder lies between the temperate regions and the tundra of the frigid zones.

A measure of world increases possible through technology on land now in production can be taken from the wartime record of American farmers. Further, the Department of Agriculture and the Land Grant Colleges estimated some time ago that it would be entirely practicable to increase U. S. agricultural production by about 20 per cent or more under nearly full employment. At least equivalent increases are possible in other countries in the temperate region.

From a physical and biological standpoint, Dr. Kellogg says that without new soils the food needs of the world could be met for cereals, roots and tubers, and sugar. New soils, or further increases in yields beyond those estimated, would be needed to suply a bit more fats and oils, and much more beans, peas and nuts, fruits and vegetables, meat and milk.

Fundamental research, education, and parallel development of industry are the main factors involved in the development of efficient world agriculture in Dr. Kellogg's opinion.

Fundamental science is essential, he says. Only a little agricultural technology now used in the temperate zones will apply to the tropics, but the principles of scientific theory can be transferred. By helping start research institutes with able scientists in charge, America and Europe can give real impetus to the rise of civilization in the tropics.

The people in each community must learn to help themselves through whatever programs or devices needed. Dr. Kellogg believes

the slow way of helping people develop their own skill and understanding is the fastest way to lasting achievement.

One technology depends on another, he points out. The Tennessee Valley Authority idea of dealing with a complex pattern of interdependent resource uses will have an increasingly wide application as technology advances.

These are the long term problems. For immediate increases in world food production, Dr. Kellogg advocates the expansion of: (1) the manufacture of fertilizer in fertilizer-producing countries; (2) distribution of improved livestock germ plasm through artificial insemination and distribution of seeds of superior varieties of crops; (3) irrigation programs in promising areas; (4) development of hydroelectric power in the tropics; (5) new methods of controlling disease and insects over a wide area; (6) facilities for producing agricultural machinery, including trucks, pumps, and small tools; and (7) publication of simple illustrative pamphlets for farm families in the world who can make use of them.

Fertilizer Chemists and Control Officials to Meet in Washington

Several important meetings of agricultural chemists and control officials will be held at the Shoreham Hotel, in Washington, D. C. during the week beginning October 9th. On that day there will be a meeting of Economic Poison Control Officials.

On October 10th, the Association of American Fertilizer Control Officials will hold their annual meeting. This will be an open session and all members of the industry are invited to attend. The program includes both morning and afternoon meetings. The present officers are: president, Allen B. Lemmon, Sacramento, California; vice-president, B. D. Cloaninger, Clemson, South Carolina; secretary-treasurer, Henry R. Walls, College Park, Maryland; Executive Committee, F. W. Quackenbush, Lafayette, Indiana; J. F. Fudge, College Station, Texas; W. B. Griem, Madison, Wisconsin; L. S. Walker, Burlington Vt.

On October 11th, the 62nd Annual Convention of the Association of Official Agricultural Chemists will open and additional sessions will be held on October 12th and 13th. The officers of the A.O.A.C. are: president, G. H. Marsh, Montgomery, Alabama; vice-president, L. S. Walker, Burlington, Vermont; secretary-treasurer, H. A. Lepper, U. S. Food and Drug Administration, Washington, D. C.

Nitrogen Advisory Committee Plans Distribution Program

A meeting of the Nitrogen Producers Industry Advisory Committee was held at the Department of Commerce, Washington, D. C., on September 10th, W. T. Hart presiding. The implementing of and the progress under the 1948–49 nitrogenous fertilizer export program were reviewed.

Department officials proposed that allocation of the available supplies be made on a quarterly basis, rather than a monthly basis, because of the shortage of personnel within the department to handle the allocation program.

There was presented also a tentative draft of an order to govern the distribution of Army anhydrous ammonia for the rest of the current fertilizer year. This draft was discussed and it is understood that the final order, to be issued shortly, will follow very closely its provisions as outlined below.

Any balance of the Army anhydrous ammonia not required for the statutory preferential distribution will be distributed to commercial producers of primary nitrogen who are supplying nitrogen for the civilian export program of 1948–49, either as anhydrous ammonia or in the form of other nitrogenous fertilizer materials. The following classes of nitrogen producers who are participating in the 1948–49 export program will be eligible for a distribution: (1) primary producers of anhydrous ammonia who manufacture solid nitrogenous fertilizer materials or who regularly sell anhydrous ammonia; and (2) primary producers of by-product sulphate who will use anhydrous ammonia for increasing their output of ammonium sulphate.

Distribution will be made to these classes of nitrogen producers in quantities proportionate to the amounts of nitrogen which they are to supply for the export program during the current fertilizer year. Producers of primary nitrogen participating in the distribution of such balance will be required to agree to use the tonnage of Army anhydrous ammonia, or an equivalent quantity, for the production of a corresponding additional quantity of solid nitrogenous fertilizer materials suitable for direct application to domestic crops.

The draft contains detailed instructions for making applications. All communications should be addressed to: Chemicals Division, Office of Domestic Commerce, Department of Commerce, Washington 25, D. C., Ref: D-1.

August Tag Sales

Sales of fertilizer tax tags during August, reflecting the usual seasonal decline, were at their lowest level so far this year. Reports of State control officials in the 15 States using tax tags to The National Fertilizer Association reveal that the 344,000 equivalent short tons reported for August were five per cent below July, when sales amounted to 362,000 tons, and 16 per cent below the 409,000 tons reported for last August. August sales last year, however, were the highest on record.

Sales in the 11 Southern States, totaling 201,000 tons, accounted for 59 per cent of the total, compared with 68 per cent a year ago. With respect to last August, all but two of the Southern States, Arkansas and Texas, reported decreases, with the overall drop amounting to 28 per cent. Decreases ranged from 1,600 tons for Alabama to 22,000 tons for Tennessee.

The four Midwestern States, with total sales amounting to 142,000 tons, showed a nine per cent increase over the 130,000 tons reported for last year. Individually, each State reported a gain, with Missouri having the greatest of all 15 reporting States, as they were during August of 1946 and 1947.

Total sales for the first eight months of the year were ten per cent above the 6,326,000 tons reported for the same period last year. Such sales represented a new high for January-August and were 68 per cent above the January-August 1935–1939 average of 4,143,000 tons.

(*Continued on page 20*)

FERTILIZER TAX TAG SALES
COMPILED BY THE NATIONAL FERTILIZER ASSOCIATION

STATE	AUGUST 1948 Tons	AUGUST 1947 Tons	AUGUST 1946 Tons	% of 1947	JANUARY–AUGUST 1948 Tons	JANUARY–AUGUST 1947 Tons	JANUARY–AUGUST 1946 Tons
Virginia	36,860	50,671	54,921	98	496,630	508,000	508,916
N. Carolina	33,732	40,404	32,546	94	1,127,617	1,202,391	1,238,132
S. Carolina	21,634	24,348	17,960	105	678,070	648,549	692,521
Georgia	11,237	31,950	13,794	101	941,653	929,173	932,742
Florida	42,200	48,999	46,351	91	470,773	516,593	618,077
Alabama	11,703	13,300	11,150	136	815, 58	600,450	711,650
Tennessee	10,901	33,030	25,994	116	328,623	283,174	272,419
Arkansas	7,746	1,687	6,7	139	188,871	135,517	132,800
Louisiana	1,471	4,338	2,005	103	135,778	131,818	138,618
Texas	20,270	20,192	8,904	120	300,486	250,055	225,705
Oklahoma	3,600	9,500	2,950	166	94,836	57,292	35,748
Total South	201,354	278,419	223,275	106	5,578,595	5,263,012	5,507,328
Indiana	69,493	63,278	61,207	121	595,711	492,346	447,865
Kentucky	33,166	26,250	19,705	138	410,453	297,592	260,666
Missouri	30,608	16,550	18,740	156	291, 04	186,736	193,211
Kansas	8,910	24,275	6,858	91	77,723	85,823	40,085
Total Midwest	142,177	130,353	106,510	129	1,375,291	1,062,497	941,827
Grand Total	343,531	408,772	329,785	110	6,953,886	6,325,509	6,449,155

FERTILIZER MATERIALS MARKET

NEW YORK

Shortage of Nitrogen Solutions Increases Demand for Other Chemical Nitrogen Materials. Little Change in Nitrogen Price Situation. Better Demand for Organics from Feed and Fertilizer Producers. Supplies of Superphosphate and Potash Fairly Adequate

NEW YORK, September 15, 1948.

Sulphate of Ammonia

Demand continued heavy for this material due to shortage of nitrogen solutions. Mills are shipping out as fast as they produce the material No change in prices is noted.

Nitrate of Soda

No change in present price schedules was reported and shipments were going forward against previous contracts. The demand was good from all sections.

Ammonia Nitrate

Buyers continue to obtain some additional quantities of this material but very little additional material is reported available and the demand is heavy.

Nitrogen Solutions

Buyers are greatly disappointed at the amount of material they are receiving from most producers and find themselves in some cases very short of this material. No immediate change in the situation is looked for.

Nitrogenous Tankage

A good demand was found from the regular trade for this material and shipments continued to move on contract. While several lots of imported material arrived at U. S. ports last year, this year due to present low prices no imported material can be brought in profitably.

Organics

Tankage and blood were in better demand from the feed trade. Prices of $7.00 ($8.51 per unit N), f.o.b. eastern shipping points was paid for tankage and some blood sold at $7.25 ($8.82 per unit N), f.o.b. New York. Offerings were rather light due to the small meat production of some of the packers. Vegetable meals displayed intermittent strength but, on the whole, prices were unchanged. Soybean meal for forward positions was offered at about $54.00 per ton, f.o.b. Decatur and linseed meal was sold at $62.00 per ton f.o.b. western shipping points. Cottonseed meal, new crop, was being offered but most buyers were staying out of the market.

Fish Meal

With the end of the present fishing season in sight, most fish producers were either sold up or holding for better prices as they seem to feel the market will do better as soon as the fishing stops. Some Pacific Coast fish meal was being offered in the Midwestern market.

Castor Pomace

Some additional material was recently offered at the regular price of $27.50 per ton and was quickly sold to ready buyers. The demand continued good from various sections.

Bone Meal

Due to the heavy demand from the feed trade, this market is firm and several large producers are sold out for 60 days.

Phosphate Rock

Producers report the situation has eased somewhat and are in a better position to supply immediate needs of buyers.

Superphosphate

While triple superphosphate remained in a firm position, regular superphosphate was said to be accumulating at certain points due to inability of certain mixers to obtain necessary nitrogen to mix with it. The production was heavy in different sections.

Potash

Producers report a good supply of box cars and are shipping out on schedule. Some small mixers were trying to postpone delivery until they were ready to mix in the fall months.

PHILADELPHIA

Nitrogen Shortage Hinders Mixing Operations. Higher Prices Expected. Superphosphate Position Easy. Potash Demand Strong

Exclusive Correspondence to "The American Fertilizer"

PHILADELPHIA, September 13, 1948

Nitrogen continues to be in short supply, and its lack is causing mixing delay in many of the smaller plants. This tends to interfere with the movement of other materials. It is fully expected that prices generally will be higher than last year, which is the natural result of higher labor and transportation costs. Although most mixers realize this, there are quite a few nursing the forlorn hope of easier prices and they are consequently neglecting to cover while they can. They accordingly seem destined to pay still higher prices later on, if they can get the material at all.

Sulphate of Ammonia.—The supply position remains exceedingly tight, with continued strong demand. It is thought quite likely that later contract deliveries will cost more, since prices are based on prevailing market at time of delivery. Resales have been quoted at $65.00 to $75.00 per ton.

Nitrate of Soda.—Market is decidedly firm with demand for more than the current supply. Contracts cover only spot delivery.

Ammonium Nitrate.—No offerings reported although the demand is very strong. Contract shipments are reported in some cases, several months behind schedule.

Castor Pomace.—No offerings reported, and production is sold ahead on contracts.

Blood, Tankage, Bone.—Market is considerably easier, but reduced production tends to prevent any significant price decline, due to the slack demand. Feeding trade demand has dropped off considerably.

Fish Scrap.—The fishing season is about over, and while demand is weak no material price changes are reported.

Phosphate Rock.—Market continues in strong position although the demand has eased slightly due to crowded condition of many of the mixing plants. Some increase in production is noted.

Superphosphate.—Normal is quoted at 76½ cents per unit of A.P.A., with supply position fairly easy due to lack of storage space at buyers' plants.

Potash.—Demand continues ahead of supply with buyers trying hard to increase their contract commitments. Some deliveries are reported behind schedule as the continued effect of the recent strike.

CHARLESTON

Shortage of Nitrogen Key to Mixing Slow-up. Superphosphate Accumulating. No Price Changes Reported. Potash Shipments on Schedule

Exclusive Correspondence to "The American Fertilizer"

CHARLESTON, September 13, 1948.

The shortage of nitrogen in liquid and solid form is hampering production of fertilizers generally. It is further causing temporary surpluses and storage problems for other ingredients, particularly superphosphate. Potash continues short of demand but movement against contracts is practically on schedule.

Organics.—Organics continue in slack demand with only negligible sales to the fertilizer industry recently.. Domestic nitrogenous is quoted from $3.50 to $4.00 per unit of ammonia ($4.25 to $4.86 per unit N), f.o.b. works, depending on the location of the production point. South American organics remain too high in price to interest domestic buyers.

Castor Pomace.—A few sales are reported recently at $30.00 per ton in bags, f.o.b. eastern production point for fall shipment. Shipments are mainly against existing contracts at present.

Dried Ground Blood.—The market is nominally $7.25 (8.82 per unit N), in bulk, at both Chicago and New York. This market is undergoing considerable competition from vegetable oil meals and corn.

Fish Scrap and Fish Meal.—Trading is quiet but the market is relatively firm at around $130.00 per ton, in bags, f.o.b. production points in the east.

Nitrate of Soda.—Demand continues strong for this time of year and some spot shipments have been made from warehouse stocks. No contract business has been reported as it is too early in the season to make contracts.

Potash.—The market remains tight with demand exceeding production. Transportation facilities continue adequate. During the first quarter of 1948, production in the British Zone of Germany almost trebled production for the same period during 1947.

Phosphate Rock.—The market continues strong but supply conditions have shown improvement due to increased production and slightly less demand.

Superphosphate.—Demand has fallen off due to lack of storage space at mixing plants. Shortage of nitrogen for mixing with superphosphate has also aggravated the situation.

Sulphate of Ammonia.—The price at the ovens for contract quantities continues firm at $45.00 per ton in bulk. No easement in demand is quoted and the market can be described as tighter due largely to lower steel production.

Ammonium Nitrate.—Shipments of Canadian ammonium nitrate are behind schedule due to repair work necessary. Demand for all other productions of ammonium nitrate continues far in excess of supply.

Bone Meal.—Demand is rather slack with quotations for steamed 2 and 27 fertilizer grade at $60.00 per ton f.o.b. Chicago in bags. At Houston, 3 and 30 grade is quoted at $50.00, in bags.

CHICAGO

Organics Market in Stronger Position. Supply Limited and Higher Prices Expected

Exclusive Correspondence to "The American Fertilizer"

CHICAGO, September 13, 1948.

The middle west market on animal ammoniates is in a stronger position. The demand for protein feeding materials has increased noticeably during the past week or ten days and, with production still at a low point at both packinghouses and rendering plants, the available supply is limited. Higher prices have been paid and are generally bid, but because of the low production offerings are

scarce and trading is limited due to seller's anticipation of still higher values.

Dried blood and unground wet rendered tankage last sold at $7.50 per unit of ammonia ($9.12 per unit N). This price is obtainable on further quantities but nothing is offered. Dry rendered tankage sold at $1.65 and $1.70 per unit of protein, f.o.b. midwest shipping points. These prices are bid depending upon location but trading is curtailed due to the absence of offerings.

Meat scraps range from $95.00 to $100.00 per ton and digester tankage at $110.00 per ton, sacked, f.o.b. shipping points. It is anticipated that these prices will be raised $5.00 to $10.00 per ton. Bone meal, 65 per cent B.P.L., is quoted $65.00 to $70.00 per ton and raw bone meal at $62.00 to $62.50 per ton.

AUGUST TAG SALES

(Continued from page 14)

Sales in the 11 Southern States, totaling 5,579,000 tons, were at a record level for January-August, and were six per cent above the 5,263,000 tons reported for the same period last year. Cumulative sales in the Southern States comprised 80 per cent of sales in all 15 States this year and 83 per cent last year. Compared with the first eight months of 1947, January-August sales were lower for Virginia, North Carolina and Florida, with the greatest decrease amounting to only nine per cent. The remaining eight States reported increases, ranging from one per cent for Georgia to 66 per cent for Oklahoma.

The four Midwestern States also reported a new high for January-August. Sales of 1,375,000 tons were 29 per cent above the same period last year and 46 per cent above two years ago. Compared with January-August 1947, sales were greater for three States, while sales in Kansas were off nine per cent.

July Superphosphate

Total production of superphosphate during July at 180 plants in the United States amounted to 740,000 equivalent short tons (basis 18 per cent A.P.A.), according to reports submitted to The National Fertilizer Association and a summary of reports submitted to the Bureau of the Census. This production figure was the lowest reported so far this year and was nine per cent below the 809,000 tons recorded for a year ago. Compared with July 1946, however, production was nine per cent higher. Total supply, 2,064,000 tons, was 23 per cent greater than that reported for last July. Shipments during the month, amounting to 341,000 tons, were below a year ago, as was the total reported for use in mixed goods. Stocks at the end of July, which amounted to 1,418,000 tons, were substantially above those for July 31, 1947, the increase amounting to 57 per cent.

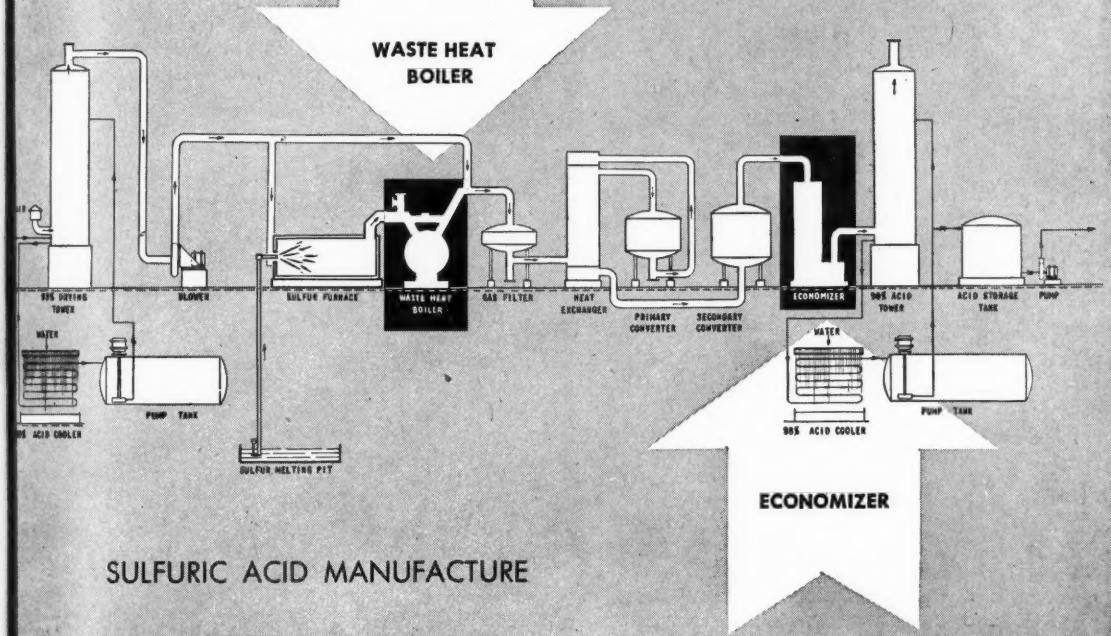
During July, production of normal superphosphate amounted to 642,000 tons (basis 18 per cent A.P.A.), or 86.8 per cent of total equivalent production. Such production was 11 per cent below the 720,000 tons reported for a year ago, when normal superphosphate comprised 89.0 per cent of total production. The production total recorded for wet base goods, 2,400 tons (18 per cent A.P.A.), was considerably below that for a year ago, and it represented less than half of one per cent of all July production.

Production of concentrated superphosphate during July totaled 38,200 tons (45 per cent A.P.A.). Such production was four per cent below the record level of 39,800 tons, reached in May of this year, but it was 13 per cent greater than the 33,800 tons reported for July 1947. During fiscal 1947–48, production of concentrated superphosphate averaged slightly less than 10 per cent of total equivalent production, but for July that production rep-

Heat Recovery

...an *extra* saving in

CHEMICO CONTACT ACID PLANTS



SULFURIC ACID MANUFACTURE

Chemico pioneered in the recovery of heat resulting from the combustion of sulfur and from the conversion of SO_2 to SO_3 in contact acid plants. Converting this heat to high pressure steam in waste heat boilers and economizers makes these benefits available:

- ***Economy of operation. Recovered heat premelts the sulfur . . . steam replaces electric power for driving machinery, and heats the buildings in cold weather.***
- ***Combustion gases are cooled to suitable temperatures for conversion.***
- ***The need for a separate supply of steam is eliminated.***

Chemico Plants are profitable investments

CHEMICAL CONSTRUCTION CORPORATION

EMPIRE STATE BLDG., 350 FIFTH AVENUE, NEW YORK 1, N. Y.

EUROPEAN TECHNICAL REPRESENTATIVE
CYANAMID PRODUCTS, LTD., BRETTENHAM HOUSE, LANCASTER PLACE, LONDON W. C. 2, ENGLAND
CABLES: CHEMICONST, NEW YORK

CC 166

resented almost 13 per cent of all production.

For the first seven months of the year, total equivalent production amounted to 6,381,000 tons (18 per cent A.P.A.), an increase of seven per cent over the 5,940,000 tons reported for the same period last year. Cumulative shipments, amounting to 3,469,000 tons, were eight per cent greater than the January–July 1947 total of 3,222,000 tons, but the amount of superphosphate used in mixed goods, 2,628,000 tons, was four per cent lower.

	Normal 18% A.P.A.	Concentrated 45% A.P.A.	Base Goods 18% A.P.A.
Production	Tons	Tons	Tons
July, 1948	642,096	38,168	2,370
June, 1948	732,500	36,002	3,044
July, 1947	719,682	33,810	4,710
Shipments and used in producing plants			
July, 1948	590,811	22,048	592
June, 1948	552,544	45,944	1,792
July, 1947	684,340	33,222	2,171
Stocks on hand			
July, 1948	1,248,034	65,746	5,113
June, 1948	1,182,082	49,627	3,335
July, 1947	749,473	59,021	6,354

Phillips Chemical To Build Sulphate of Ammonia Plant

Phillips Chemical Company, a wholly-owned subsidiary of Phillips Petroleum Company, has taken possession of the Todd Shipyard property on the Houston (Texas) Ship Channel. The 338-acre tract with all docks, buildings, supplies and improvements, has been sold to Phillips by War Assets Administration. The property will be turned over to the Company on September 23, 1948, at which time the name "Todd Shipyard" was dropped and the facilities rechristened "Port Adams," for K. S. Adams, president of the company.

Prior to actual acquisition of the facilities, Phillips had already made preliminary surveys of the property and construction of the first chemical unit will be started immediately. This has been designed to produce 266,000 tons per year of sulphate of ammonium. Because of the buildings and facilities already available on the site, half the plant's capacity will be in operation before December 1, 1948, and total capacity will be reached early in 1949.

The contractor employed for the ammonium sulphate plant is Chemical Construction Corporation, while dock and marine work will be by Brown and Root, Inc. Approximately 300 employees will be required in the construction work and this unit of the plant will employ over 200 people when in full operation.

The plant's entire production of ammonium sulphate has been contracted to the Army until June 30, 1949. All deliveries will be made to ships supplied by the Army at the Company's docks. This means increase of more than one quarter million tons of outbound shipping per year on the channel.

Anhydrous ammonia will be supplied to the sulphate plant from the Cactus Ordnance Works near Etter in the Texas Panhandle. This plant, which now produces 200 tons of ammonia per day, was leased to Phillips Chemical Company by the Army August 16, 1948. The Company is now rushing construction of additional facilities to increase the plant capacity to over 400 tons a day which is sufficient to make approximately 500,000 tons of nitrogenous fertilizer a year. The

Company is also constructing an ammonium nitrate plant near Etter, Texas.

In addition to the sulphate plant, the Port Adams property will be used for future expansion of the Company's chemical operations and will also be used as an export-import terminal. The docks are being rebuilt and ship ways and temporary buildings are being removed to make way for storage space. The Port will also be used by Phillips Petroleum Company for shipment of material and supplies used in its foreign activities and its drilling operations in Gulf coastal waters. The port facilities will be operated in conjunction with the nearby petroleum products terminal which Phillips now owns on the ship channel near Pasadena, Texas.

SOIL CONSERVATION RAISES MIDWEST CROP POTENTIALS

(*Continued from page 10*)

parts of the Midwest where a lack of moisture is not a limiting factor. Conservation practices which conserve moisture make fertilizer more effective.

Seven years of accurate records kept on farms in Illinois show that corn yields on contoured fields were 12 per cent higher (6.9 bushels increase) than yields from corn grown in the traditional straight rows on the same soil type on the same farms. The same tests indicated that contouring increased soybean yields 13 per cent and oats and wheat yields 16 and 17 per cent respectively.

Use of contouring or other erosion control practices as part of a complete farm conservation plan increases yields for three reasons: (1) Soil erosion is retarded or eliminated; (2) a greater proportion of the cropland can be in grain without danger of erosion; and (3) plant-food elements and soil moisture, which might otherwise be lost through runoff, are held in the soil.

Reports from 7,092 farms in the Upper Mississippi Region indicate that use of fertilizer increased farm yields from 43.1 to 57.4 bushels per acre, or 33.2 per cent. Use of fertilizer on small grain is already a common practice in the eastern and southern parts of the region. Reports from farmers indicate that fertilizer used on oats increased yields by an average of about 12 bushels per acre, or 34 per cent. Studies indicate that noraml application of fertilizer resulted in an additional 140 bushels of corn for each ton of fertilizer and an additional 100 bushels of wheat for each ton of fertilizer applied.

Fertilizer on Pastures

Commercial fertilizer applied to roughages brings definite increases in yields. The supply of roughage under a conservation system of farming usually will be quite adequate for the number of livestock that can be handled. For that reason, farmers normally will depend on carry-over effects from fertilizer applied on the small grain crop the previous year. Were fertilizers used on all small grains, the carry-over effect would greatly boost the yield of nearly 30 million acres of hay and rotation pasture. Moderate quantities of fertilizer applied directly to rotation hay and pasture crops in this region will increase yields at least 50 per cent.

Commercial fertilizer on permanent pastures gives even more striking increases. Many farmers report doubled yields. The extent to which farmers can afford to fertilize permanent pastures depends on whether or not they need the additional feed. However, many pastures need fertilizers so they can provide adequate cover to prevent erosion, regardless of whether the feed is needed or not.

Before the war, farmers in the North Central States produced feed grain crops (1937–41) equivalent in feeding value to 66.1 million tons of corn per year. Under conserva-

tion farming, feed grain production might well provide the equivalent of 77.9 million tons of corn, or a 12 per cent increase. Pasture and hay land prior to the war produced roughage equal in feed value to 91.3 million tons of hay. If recommended practices were adopted by all farmers, roughage production might equal the feeding value of 170 million tons of hay. Its quality would be higher than tons of hay. Its quality would be higher than pre-war roughage because of increased amounts of legumes.

Farmers used roughage for about 45 per cent of the livestock ration before the war. To use the feed produced under a complete conservation system of farming in these eight states, they would need to use roughage for about 55 per cent of the livestock ration.

Shift in Farm Practices

Obviously, this change in available livestock feed will require some changes in type of farming and livestock numbers. Shifts in acreages and practices will be more radical on some individual farms than the average change over the entire region. This will be especially true on farms where erosion is serious or where land has been pushed far beyond its natural capabilities to produce. Conversely, on some farms the change in acreage or total production of various feeds will be much less than average.

Dairy farmers could adjust to the change by shifting from corn silage to either legume-grass silage or hay for roughage. From the standpoint of actual income they probably would find it more profitable to feed a higher proportion of hay in the livestock ration.

Increasing beef production rather than hogs offers one of the best solutions for the use of more roughage. In the pre-war years, hogs obtained 88 per cent of their feed units from grains and about 1 per cent from roughage. Beef cattle, however, consumed rations including about 30 per cent grain and 63 per cent roughage. While cattle required nearly one and one-half times as many feed units as hogs per pound of meat produced, they used the feed more nearly in the proportions that farmers would have it under a conservation system of farming. In this connection many individual farmers are beginning to use a much larger amount of roughage especially alfalfa-brome grass pasture, in pork production.

With the increased pasture and hay that would be available, the Corn Belt and Lake States probably would increase livestock production about 40 per cent to utilize the available roughage. Complete use of all the roughage could mean a 20 to 25 per cent increase in dairy production and more than doubling of beef production. Hog production probably would return to about 1937–1941 levels.

Assuming that farmers will produce 40 per cent more meat in the North Central States than before the war and that most of the increase will be in the form of beef, they would need 140 million bushels less corn, 800,000 tons less small grain, and about 24 million tons more hay or its equivalent in pasture than they would use to produce the same total amount of meat if beef and pork production were increased by equal percentages.

This fact, reduced to similar words, means that increasing beef production requires less grain than increasing pork production.

In addition to these increases in livestock production the states would still raise considerably more feed grains, especially corn, than they would require for feeding on the farm. This means that farmers would continue to ship out grain.

Changes Affect Other Regions

Mr. Walter explained that changes in production in other regions undoubtedly would affect the changes in the Upper Mississippi Region. For example, changes in other regions in beef production, dairy production, or any other commodity might influence the change that would occur in these eight states. So a complete and accurate picture of the effect of complete application of soil and water conservation for the United States or any one region cannot be obtained until similar studies are completed for all major areas.

Mr. Walter declared that it is desirable for the United States to know the possible production of its agricultural resources when properly used and conserved for continued production. Thus, we will know what can be produced in physical terms, the extent to which we can increase our yields of food and fiber to meet the needs of an increasing population, or the extent to which we can be self-sufficient in times of national emergency. Equally important is knowing how much food and fiber the United States can contribute to deficit areas of the world without destruction of its own soil resources and consequent danger to the future strength of the nation.

Land is only one factor of production. Agricultural output depends largely upon the degree to which labor, equipment, and materials are combined with land. But the land and water resources must be preserved if the production of food and fiber is to be maintained.

Agricultural production and soil conservation are closely related because conservation maintains the basic resources on which agriculture depends. Many of the recent improvements in crop production, including conservation measures, the report states, are of a permanent nature and will not be abandoned if markets shrink.

A Flexible Plan

If agricultural surpluses should appear, farmers will not find a solution in reducing soil conservation. Adjustment of production to reduced market demand for certain items might mean using the highly productive lands less intensively or it might call for developing new outlets for agricultural products. This does not conflict with the idea that conservation farm plans should permit the production of the commodities demanded in the markets. A change in market outlet due to a shift in demand will call for a change in conservation plans to meet the new situation. The type of farm conservation plan which farmers are developing with the help of Soil Conservation Service technicians, obtained through their locally organized soil conservation districts, is flexible enough to permit these adjustments when needed.

The changes made on each farm will depend on the physical factors (soil type, slope, and degree of erosion), the type of farming the individual prefers, and the relative prices for crops and livestock he can produce. Every farmer has a choice of alternative methods providing equally effective conservation systems of farming, any one of which is designed to control erosion and maintain the productivity on his farm. Therefore, the farmer can choose the type of conservation farming that will conserve his soil, increase his farm's production to the maximum extent, and return the most profit at the same time he protects his soil and water resources for continued use.

BUYERS' GUIDE • A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

AMMONIA—Anhydrous and Liquor
Commercial Solvents Corp., New York City
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Lion Oil Co., El Dorado, Ark.
Spencer Chemical Co., Kansas Cy, Mo.

BAG MANUFACTURERS—Burlap
Bemis Bros. Bag Co., St. Louis, Mo.
Chase Bag Co., Chicago, Ill.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Chase Bag Co., Chicago, Ill.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Paper
Bemis Bro. Bag Co., St. Louis, Mo.
Chase Bag Co., Chicago, Ill.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Hammond Bag & Paper Co., Welisburg, W. Va.
International Paper Co., Bagpak Div., New York City
Jaite Company, The, Jaite, Ohio
Raymond Bag Co., Middletown, Ohio
St. Regis Paper Co., New York City

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
Huber & Company, New York City
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
St. Regis Paper Co., New York City
Union Special Machine Co., Chicago, Ill.

BAG PRINTING MACHINES
Schmutz Mfg. Co., Louisville, Ky.

BAGGING MACHINES—For Filling Sacks
Atlanta Utility Works, The, East Point, Ga.
St. Regis Paper Co., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Company, Boston, Mass.

BONE BLACK
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Huber & Company, New York City

BONE PRODUCTS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
Huber & Company, New York City
Jackle, Frank R., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
Huber & Company, New York City
Jackle, Frank R., New York City.
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Schrock Fertilizer Service, Congerville, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—For Hoists, Cranes, etc.
Hayward Company, The, New York City

BUCKETS—Elevator
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CARS AND CARTS
Atlanta Utility Works, The, East Point, Ga.
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind

CHEMICALS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Commercial Solvents Corp., New York City
Davison Chemical Corporation, Baltimore, Md.
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Spencer Chemical Co., Kansas City, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CONDITIONERS
Arkansas Rice Growers Corp. Assn., Stuttgart, Ark
Jackle, Frank R., New York City.
Keim, Samuel D., Philadelphia, Pa.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

CYANAMID
American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Monsanto Chemical Co., St. Louis, Mo.
Chemical Construction Corp., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.
Titlestad Corporation, Nicolay, New York City

FERTILIZER (Mixed) MANUFACTURERS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City.
McIver & Son Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

FOUNDERS AND MACHINISTS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind

A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the Advertisers, see page 33

HOPPERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES
American Agricultural Chemical Co., New York City

LEAD BURNERS
Southern Lead Burning Co., Atlanta, Ga.

LIMESTONE
American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

LOADERS—Car and Wagon
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Elevating and Conveying
Atlanta Utility Works, The, East Point, Ga.
Hough Co., The Frank G., Libertyville, Ill.
Hayward Company, The, New York City
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Material Handling
Atlanta Utility Works, The, East Point, Ga.
Hayward Company, The, New York City
Hough Co., The Frank G., Libertyville, Ill.
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Mixing, Screening and Bagging
Atlanta Utility Works, The, East Point, Ga.
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md
Stedman's Foundry and Mach. Works, Aurora, Ind
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Superphosphate Manufacturing
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MANGANESE SULPHATE
McIver & Son, Alex. M., Charleston, S. C.

MINOR ELEMENTS
Tennessee Corporation, Atlanta, Ga.

MIXERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

NITRATE OF SODA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Il
McIver & Son, Alex. M., Charleston, S. C.

NITROGEN SOLUTIONS
Lion Oil Company, El Dorado, Ark.
Spencer Chemical Co., Kansas City, Mo.

NITROGENOUS ORGANIC MATERIAL
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J. New York City
Davidson Commission Co., The, Chicago, Ill.
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill
Jackle, Frank R., New York City.
Maryland Drying Mach. Co., Baltimore, Md.
McIver & Son Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.

PHOSPHATE ROCK
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

PLANT CONSTRUCTION—Fertilizer and Acid
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Southern Lead Burning Co., Atlanta, Ga.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.
Titlestad Corporation, Nicolay, New York City

POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City.

POTASH SALTS—Manufacturers
American Potash and Chem. Corp., New York City
Potash Co. of America, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
United States Potash Co., New York City

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

PYRITES—Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.

REPAIR PARTS AND CASTINGS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BUYERS' GUIDE

SCALES—Including Automatic Bagging
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SCREENS
Atlanta Utility Works, The, East Point, Ga.
Link-Belt Co., Chicago, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

SEPARATORS—Air
Kent Mill Co., Brooklyn, N. Y.
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Co., Boston, Mass.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SULPHATE OF AMMONIA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULPHUR
Ashcraft-Wilkinson Co., Atlanta, Ga.

SULPHURIC ACID
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicaro, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davison Chemical Corporation, Baltimore, Md.
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

TAGS
Keener Mfg. Co., Lancaster, Pa.

TANKAGE
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

VALVES
Atlanta Utility Works, The, East Point, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

Alphabetical List of Advertisers

Quality and Service

You are assured on two important points — even in today's abnormal market — when you deal with P. C. A.

1. Quality . . . our Red Indian products are of unquestioned excellence.
2. Service . . . we make every effort to give you the service you want and deserve.

When better service is possible be assured P. C. A. will give it. Meanwhile your confidence, and your patience are greatly appreciated.

POTASH COMPANY OF AMERICA

CARLSBAD, NEW MEXICO

GENERAL SALES OFFICE . . 50 Broadway, New York, N. Y. • MIDWESTERN SALES OFFICE . . First National Bank Bldg., Peoria, Ill.
SOUTHERN SALES OFFICE . . Candler Building, Atlanta, Ga.

CHASE *SERVES ALL INDUSTRY AND AGRICULTURE...*

FOR more than one hundred years, Chase has been manufacturing bags for industry and agriculture. This is important to you because our long and wide experience enables us to recommend the container that best combines efficiency and economy—whatever your product may be—dry or wet chemicals and compounds . . . soluble, granulated or solid products . . . fragile, durable, or perishable products. Your Chase Salesman will be glad to tell you about the protective features of Chase's complete line of Better Bags . . . through the use of adhesives, coatings, and liners in connection with textiles and papers.

CHASE ENGINEERING

Chase engineers, chemists, and technically trained bag salesmen have been responsible for many new packaging achievements during the past century. The future holds even greater promise for further important Chase Bag developments—continuing to give you better and more economical containers for your products.

for Better Bags...Better Buy Chase

CHASE BAG CO. GENERAL SALES OFFICES, 309 WEST JACKSON BLVD., CHICAGO 6, ILL.

BOISE • BUFFALO • CHAGRIN FALLS, O. • CLEVELAND • CROSSETT, ARK. • DALLAS • DENVER • DETROIT • GOSHEN, IND. HARLINGEN, TEXAS • HUTCHINSON, KAN. • KANSAS CITY • MEMPHIS • MILWAUKEE • MINNEAPOLIS • NEW ORLEANS • NEW YORK OKLAHOMA CITY • ORLANDO, FLA. • PHILADELPHIA • PITTSBURGH • PORTLAND, ORE. • REIDSVILLE, N.C. • ST. LOUIS • SALT LAKE CITY • TOLEDO